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IV.

Tables of the present Value of a Life-Annuity at any Age, according to Dr. Wigglesworth's Bill of Mortality.

BY J. INGERSOLL BOWDITCH.

THE Table, exhibiting the Law of Mortality in the northern part of the United States, given by Dr. Wigglesworth, in the second volume of the Memoirs of the American Academy, being generally used in Massachusetts, to ascertain the value of a Dower-right, it was thought advisable to construct the following Tables to facilitate such calculations.

TABLE I. Exhibits the Expectation of Life, expressed in years and decimals of a year, in the United States, and in the City of Carlisle (England), at intervals of five years. These agree nearly with each other in the middle ages, but there is a considerable difference in ages below 20 years; the Carlisle bill of mortality giving a much greater expectation than most tables, which have been published.

TABLE II. Exhibits the Expectation of Life in the United States at every age, according to Dr. Wigglesworth's Table. Thus at the age of 50 years, the expectation of life is $21\frac{17}{100}$ years.

TABLE III. Exhibits the value of a life-right in the income of \$ 100, supposing the rate of interest to be 5 or 6 per cent. Thus the value of the life-right of a person aged 50, interest being six per cent., is $62 \frac{7.3}{100}$ per cent. Subtracting this from \$ 100, leaves the present value of the reversion $37 \frac{2.8}{100}$ per cent. Hence if the estate was worth \$ 10,000, the present value of the life-right would be \$ 6272, and the present value of the reversion \$ 3728.

TABLE IV. Exhibits the value of a Widow's Dower in the income of \$ 100. It is exactly one third of the value given by Table III.

Thus if a widow has a right of dower in an estate worth \$ 3000, her age being 40 years, and the rate of interest 5 per cent., we should find by the Table the present value of her life right to be worth 21 per cent.; hence we get the present value of her dower, \$ 630. We get nearly the same result from Table III., where the life-right is $62 \frac{2.2}{100}$ per cent. on her third part of \$ 3000, or \$ 1000 set off to her for dower, making its present value \$ 629.90.

TABLE V. Exhibits the value of an annuity on a single life at every age. Thus a person at the age of 30 must pay \$ 13.27 to secure an annuity of one dollar per annum, interest being at five per cent.; or \$ 11.80, interest being at six per cent.

TABLE I. *Showing the Expectation of Life at Intervals of five Years, according to Dr. Wigglesworth's Table, for the United States, and Milne for the City of Carlisle in England.*

Age.	U. States.	Carlisle.	Age.	U. States.	Carlisle.	Age.	U. States.	Carlisle.
years.	years.	years.	years.	years.	years.	years.	years.	years.
0	28.15	38.72	35	28.22	31.00	65	12.43	11.79
5	40.88	51.25	40	26.04	27.61	70	10.06	9.18
10	39.23	48.82	45	23.92	24.46	75	7.83	7.01
15	36.17	45.00	50	21.17	21.11	80	5.85	5.51
20	34.22	41.46	55	18.35	17.58	85	4.57	4.12
25	32.33	37.86	60	15.45	14.34	90	3.73	3.28
30	30.25	34.34						

TABLE II. *Showing the Expectation of Life, deduced from Dr. Wigglesworth's Table of Mortality.*

Age.	Expectation.	Age.	Expectation.	Age.	Expectation.	Age.	Expectation.
years.	years.	years.	years.	years.	years.	years.	years.
0	28.15	24	32.70	48	22.27	72	9.14
1	36.78	25	32.33	49	21.72	73	8.69
2	38.74	26	31.93	50	21.17	74	8.25
3	40.01	27	31.50	51	20.61	75	7.83
4	40.73	28	31.08	52	20.05	76	7.40
5	40.88	29	30.66	53	19.49	77	6.99
6	40.69	30	30.25	54	18.92	78	6.59
7	40.47	31	29.83	55	18.35	79	6.21
8	40.14	32	29.43	56	17.78	80	5.85
9	39.72	33	29.02	57	17.20	81	5.50
10	39.23	34	28.62	58	16.63	82	5.16
11	38.64	35	28.22	59	16.04	83	4.87
12	38.02	36	27.78	60	15.45	84	4.66
13	37.41	37	27.34	61	14.86	85	4.57
14	36.79	38	26.91	62	14.26	86	4.21
15	36.17	39	26.47	63	13.66	87	3.90
16	35.76	40	26.04	64	13.05	88	3.67
17	35.37	41	25.61	65	12.43	89	3.56
18	34.98	42	25.19	66	11.96	90	3.73
19	34.59	43	24.77	67	11.48	91	3.32
20	34.22	44	24.35	68	11.01	92	3.12
21	33.84	45	23.92	69	10.50	93	2.40
22	33.46	46	23.37	70	10.06	94	1.98
23	33.08	47	22.83	71	9.60	95	1.62

TABLE III. *Showing the present Value of a Life-Right in the Income of \$100, at every Age, calculating the Interest at five and at six per cent., according to Dr. Wigglesworth's Table of Mortality.*

Age.	Interest, 5 pr. ct.	Interest, 6 pr. ct.	Age.	Interest, 5 pr. ct.	Interest, 6 pr. ct.	Age.	Interest, 5 pr. ct.	Interest, 6 pr. ct.	Age.	Interest, 5 pr. ct.	Interest, 6 pr. ct.
0	49.01	51.50	24	68.08	72.31	48	59.02	64.24	72	31.64	35.95
1	64.39	67.61	25	67.87	72.14	49	58.25	63.50	73	30.32	34.51
2	68.13	71.51	26	67.62	71.92	50	57.44	62.72	74	29.04	33.11
3	70.78	74.30	27	67.30	71.63	51	56.60	61.90	75	27.76	31.70
4	72.55	76.19	28	66.98	71.34	52	55.73	61.05	76	26.42	30.23
5	73.34	77.06	29	66.66	71.06	53	54.83	60.16	77	25.09	28.76
6	73.56	77.32	30	66.35	70.78	54	53.89	59.23	78	23.78	27.30
7	73.73	77.55	31	66.04	70.51	55	52.91	58.25	79	22.52	25.89
8	73.72	77.59	32	65.74	70.25	56	51.88	57.23	80	21.33	24.56
9	73.53	77.44	33	65.45	69.99	57	50.82	56.15	81	20.08	23.16
10	73.23	77.17	34	65.17	69.75	58	49.70	55.03	82	18.88	21.80
11	72.69	76.65	35	64.89	69.52	59	48.53	53.83	83	17.84	20.63
12	72.10	76.07	36	64.51	69.17	60	47.31	52.58	84	17.11	19.81
13	71.48	75.47	37	64.13	68.83	61	46.03	51.25	85	16.90	19.60
14	70.84	74.82	38	63.75	68.50	62	44.68	49.84	86	15.53	18.03
15	70.16	74.14	39	63.37	68.16	63	43.27	48.36	87	14.33	16.66
16	69.88	73.89	40	62.99	67.84	64	41.78	46.78	88	13.48	15.69
17	69.64	73.67	41	62.63	67.52	65	40.21	45.10	89	13.09	15.25
18	69.41	73.46	42	62.26	67.21	66	39.07	43.90	90	14.03	16.39
19	69.18	73.27	43	61.91	66.91	67	37.90	42.66	91	12.41	14.53
20	68.96	73.07	44	61.57	66.63	68	36.70	41.39	92	10.49	12.31
21	68.75	72.89	45	61.19	66.31	69	35.48	40.08	93	8.58	10.10
22	68.51	72.68	46	60.49	65.65	70	34.22	38.74	94	6.75	7.96
23	68.29	72.49	47	59.77	64.96	71	32.95	37.36	95	5.19	6.13

TABLE IV. *Showing the Value of a Widow's Dower in the Income of \$100, at every Age, calculating the Interest at five and at six per cent., according to Dr. Wigglesworth's Table of Mortality.*

Age.	5 pr. ct.	6 pr. ct.	Age.	5 pr. ct.	6 pr. ct.	Age.	5 pr. ct.	6 pr. ct.	Age.	5 pr. ct.	6 pr. ct.
0	16.34	17.17	24	22.69	24.10	48	19.67	21.41	72	10.55	11.98
1	21.46	22.54	25	22.62	24.05	49	19.42	21.17	73	10.11	11.50
2	22.71	23.84	26	22.54	23.97	50	19.15	20.91	74	9.68	11.04
3	23.59	24.77	27	22.43	23.88	51	18.87	20.63	75	9.25	10.57
4	24.18	25.40	28	22.33	23.78	52	18.58	20.35	76	8.81	10.08
5	24.45	25.69	29	22.22	23.69	53	18.28	20.05	77	8.36	9.59
6	24.52	25.77	30	22.12	23.59	54	17.96	19.74	78	7.93	9.10
7	24.58	25.85	31	22.01	23.50	55	17.64	19.42	79	7.51	8.63
8	24.57	25.86	32	21.91	23.42	56	17.29	19.08	80	7.11	8.19
9	24.51	25.81	33	21.82	23.33	57	16.94	18.72	81	6.69	7.72
10	24.41	25.72	34	21.72	23.25	58	16.57	18.34	82	6.29	7.27
11	24.23	25.55	35	21.63	23.17	59	16.18	17.94	83	5.95	6.88
12	24.03	25.36	36	21.50	23.06	60	15.77	17.53	84	5.70	6.60
13	23.83	25.16	37	21.38	22.94	61	15.34	17.08	85	5.63	6.53
14	23.61	24.94	38	21.25	22.83	62	14.89	16.61	86	5.18	6.01
15	23.39	24.71	39	21.12	22.72	63	14.42	16.12	87	4.78	5.55
16	23.29	24.63	40	21.00	22.61	64	13.93	15.59	88	4.49	5.23
17	23.21	24.56	41	20.88	22.51	65	13.40	15.03	89	4.36	5.08
18	23.14	24.49	42	20.75	22.40	66	13.02	14.63	90	4.68	5.46
19	23.06	24.42	43	20.64	22.30	67	12.63	14.22	91	4.14	4.84
20	22.99	24.36	44	20.52	22.21	68	12.23	13.80	92	3.50	4.10
21	22.92	24.30	45	20.40	22.10	69	11.83	13.36	93	2.86	3.37
22	22.84	24.23	46	20.16	21.88	70	11.41	12.91	94	2.25	2.65
23	22.76	24.16	47	19.92	21.65	71	10.98	12.45	95	1.73	2.04

TABLE V. *Showing the Value of an Annuity on a Single Life at every Age, deduced from the Tables by Dr. Wigglesworth.*

Age.	5 pr. ct.	6 pr. ct.	Age.	5 pr. ct.	6 pr. ct.	Age.	5 pr. ct.	6 pr. ct.	Age.	5 pr. ct.	6 pr. ct.
0	9.802	8.584	25	13.574	12.024	50	11.487	10.453	75	5.551	5.284
1	12.877	11.268	26	13.523	11.987	51	11.320	10.317	76	5.284	5.038
2	13.625	11.919	27	13.459	11.938	52	11.146	10.175	77	5.018	4.793
3	14.155	12.384	28	13.395	11.890	53	10.965	10.027	78	4.756	4.550
4	14.509	12.698	29	13.332	11.843	54	10.777	9.872	79	4.503	4.315
5	14.668	12.843	30	13.270	11.797	55	10.581	9.709	80	4.265	4.093
6	14.711	12.887	31	13.208	11.752	56	10.376	9.539	81	4.016	3.860
7	14.745	12.925	32	13.148	11.708	57	10.163	9.359	82	3.775	3.633
8	14.743	12.931	33	13.090	11.665	58	9.939	9.171	83	3.568	3.439
9	14.706	12.906	34	13.033	11.625	59	9.706	8.972	84	3.421	3.301
10	14.646	12.862	35	12.978	11.587	60	9.462	8.763	85	3.380	3.266
11	14.538	12.775	36	12.901	11.529	61	9.205	8.541	86	3.105	3.005
12	14.420	12.679	37	12.825	11.472	62	8.936	8.307	87	2.866	2.777
13	14.296	12.578	38	12.749	11.416	63	8.654	8.060	88	2.696	2.615
14	14.167	12.470	39	12.673	11.360	64	8.356	7.797	89	2.617	2.542
15	14.031	12.357	40	12.598	11.306	65	8.042	7.517	90	2.805	2.731
16	13.976	12.315	41	12.525	11.253	66	7.813	7.317	91	2.481	2.422
17	13.928	12.279	42	12.452	11.201	67	7.579	7.110	92	2.097	2.052
18	13.881	12.244	43	12.382	11.152	68	7.340	6.898	93	1.716	1.683
19	13.835	12.211	44	12.313	11.105	69	7.095	6.680	94	1.350	1.327
20	13.791	12.178	45	12.238	11.052	70	6.844	6.456	95	1.038	1.022
21	13.749	12.148	46	12.098	10.942	71	6.589	6.226	96	0.744	0.734
22	13.702	12.114	47	11.954	10.827	72	6.328	5.991	97	0.562	0.555
23	13.658	12.082	48	11.804	10.707	73	6.064	5.751	98	0.476	0.472
24	13.615	12.052	49	11.649	10.583	74	5.807	5.518	99	0.000	0.000